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EXAMINER	
PHAM, KHANH B	

ART UNIT	PAPER NUMBER
2166	

DATE MAILED: 12/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/765,542	LEES ET AL.	
	Examiner	Art Unit	
	Khanh B. Pham	2166	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 August 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-86* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-86* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

2. Applicant's submission filed on August 18, 2005 has been entered. Claims 1-2, 4, 6, 8, 10-11, 13-14, 18, 27, 39, 42, 55, 73, and 81 have been amended. Claim 19 has been canceled. Claims 1-18, 20-86 are pending in this Office Action.

Claim Objections

3. **Claim 1** is objected to because of the following informalities: the limitation "made the linked value" at line 7 should be changed to "made **to** the linked value".

Claim 8 is objected to because of the following informality: "a" at line 3 should be deleted.

Appropriate correction is required.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 39-41, 64, 67, 71-72, 79-80, and 86 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 39-41, 64, 67, 71-72, 79-80, and 86 are not limited to tangible embodiments. In view of Applicant's disclosure, specification page 26 lines 4-14, the "computer readable medium" is not limited to tangible embodiments, instead being defined as including both tangible medium (e.g. "magnetic storage device") and intangible embodiments (e.g., "modulated data signal such as carrier wave", "wireless media"). As such, the claims are not limited to statutory subject matter and are therefore non-statutory.

Further, claims 39-41 are also non-statutory as directed to non-functional descriptive material. Claims 39-41 are directed to data structure stored on computer readable media which does not provide a practical application that produces a useful, tangible and concrete result.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims **1-14, 18, 20-24, 27-36, 39-40, 42-67, 72-86 are** rejected under 35 U.S.C. 103(a) as being unpatentable over Lowe-Norris ("Windows 2000 Active Directory"),

hereinafter referred to as "Norris", in view of Applicant's Admitted Prior Art in the Specification pages 1-7 and Figs. 1-2, hereinafter "AAPA".

As per claim 1, Norris teaches a network system, comprising:

- "a first computer configured to maintain an object having a multi-valued attribute" at page 68, Fig. 4-1, ("Server A" contains an object (table) having "Property name", wherein "Property name" attribute having multi-values, namely "Prop1", "Prop2" and "Passwd";

- "each linked value having associated therewith respective conflict-resolution data" at Fig. 4-1, ("Version number" and "Timestamp");

- "wherein the first computer is adapted to update the conflict-resolution data associated with at least one linked value in response to at lest a first modification made to the linked value" at pages 67-68 and Fig. 4-1;

- "at least a second computer configured to replicate the object to generate a replica object" at Fig. 4-1, ("Server B");

- "the replica linked values having associated therewith respective further conflict-resolution data" at Fig. 4-1;

- "and wherein the second computer is adapted to update the further confict-resolution data in response to at least a further modification made to the replica linked value on the second computer" at pages 67-68 and Fig. 4-1;

- "at least on of the first computer and the second computer being further configured to resolve a replication conflict between the linked value of the attribute in the object and the replica linked value of the attribute in the replica object" at page 77;

- "the replication conflict arising from the first modification made to the linked value on the first computer and from the further modification made to the replica linked value on the second computer, and the replication conflict being resolved, at least in part, based upon the conflict-resolution data and the further conflict-resolution data" at page 77, 3rd paragraph.

The difference between Norris' teaching and the invention of claim 1 is that Norris does not explicitly teach: "a multi-valued attribute that includes a value that links to a plurality of individual linked values" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having "a multi-valued attribute that includes a value that links to a plurality of individual linked values" in an directory server such as Windows 2000 Active Directory. Thus, It would have been obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and reduces resource required to maintain the consistency between

objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 2, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches: "wherein at least one of the first computer and the second computer is further configured to compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph.

As per claim 3, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a version indicator that corresponds to a version of an individual linked value" at page 68, Fig. 4-1.

As per claim 4, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches: wherein:

- "the conflict-resolution data and the further conflict-resolution data comprise at least a respective version number that corresponds to a version of an individual linked value" at page 68, Fig. 4-1;
- "and wherein at least one of the first computer and the second computer is further configured to: compare the version number associated with the linked value of the attribute in the object and the version number associated with the

linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph;

- "and update the linked value of the attribute in the replica object if the value has a lower version number than the linked value of the attribute in the object" page 77, 3rd paragraph.

As per claim 5, Norris and AAPA teaches a network system as recited in claim 1 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises an update indicator that corresponds to when an individual linked value is updated" at page 68, Fig. 4-1, ("USN, Update Sequence Number").

As per claim 6, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches wherein:

- "the conflict-resolution data and the further conflict-resolution data comprise at least respective update timestamps that correspond to when an individual linked value is updated" at page 68, Fig. 4-1;

- "and wherein at least one of the first computer and the second computer is further configured to: compare the update timestamp associated with the linked value of the attribute in the object and the update timestamp associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph;

- "and update the linked value of the attribute in the replica object if the value has an earlier update timestamp than the linked value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 7, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a creation indicator that corresponds to when an individual linked value is created" at page 68, Fig. 4-1.

As per claim 8, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches wherein:

- "the conflict-resolution data and the further conflict-resolution data comprise at least respective creation timestamps that correspond to when an individual linked value is created" at page 68, Fig. 4-1;

- "and wherein at least one of the first computer and the second computer is further configured to: compare the creation timestamp associated with the linked value of the attribute in the object and the creation timestamp associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77, 3rd paragraph;

- "and update the linked value of the attribute in the replica object if the linked value has an earlier creation timestamp than the linked value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 9, Norris and AAPA teaches a network system as recited in claim 1 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a version indicator that corresponds to a version of an individual linked value and an update indicator that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1.

As per claim 10, Norris and AAPA teaches a network system as recited in claim 1 discussed above. Norris also teaches wherein:

- "the conflict-resolution data and the further conflict-resolution data comprise at least respective version numbers that correspond to a version of an individual linked value and comprise at least respective update timestamps that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1;
- "and wherein at least one of the first computer and the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object" at page 77, 3rd paragraph;
- "and resolve the replication conflict in favor of the linked value that first has a higher version number, and second has a later update timestamp" at page 77, 3rd paragraph.

As per claim 11, Norris and AAPA teaches a network system as recited in claim 1 discussed above. Norris also teaches wherein:

- "the conflict-resolution data and the further conflict resolution data comprise at least respective version numbers that correspond to a version of an individual linked value and comprise at least respective update timestamps that correspond to when the individual linked value is updated" at page 68, Fig. 4-1 ;

- "and wherein at least one of the first computer and the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77 ;

- "update the linked value of the attribute in the replica object if the linked value has a lower version number than the linked value of the attribute in the object, and if the version number associated with the linked value of the attribute in the replica object is equivalent to the version number associated with the linked value of the attribute in the object, update the linked value of the attribute in the replica object if the linked value has an earlier update timestamp than the linked value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 12, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a creation indicator that corresponds to when an individual linked value is created, a

version indicator that corresponds to a version of the individual linked value, and an update indicator that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1.

As per claim 13, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches wherein:

- "the conflict-resolution data and the further conflict-resolution data comprise at least respective creation timestamps that correspond to when an individual linked value is created, comprise at least respective version numbers that correspond to a version of the individual linked value, and comprise at least respective update timestamps that corresponds to when the individual linked value is updated" at page 68, Fig. 4-1;
- "and wherein at least one of the first computer and the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the further conflict-resolution data associated with the linked value of the attribute in the replica object; and resolve the replication conflict in favor of the linked value that first has a later creation timestamp, second has a higher version number, and third has a later update timestamp" at page 77.

As per claim 14, Norris and AAPA teach a network system as recited in claim 1 discussed above. Norris also teaches wherein:

- "the conflict-resolution data and the further conflict resolution data comprise at least respective creation timestamps that correspond to when an individual value is created, comprise at least respective version numbers that correspond to a version of the individual value, and comprise at least respective update timestamps that correspond to when the individual linked value is updated" at page 68, Fig. 4-1;

- "and wherein at least one of the first computer and the second computer is further configured to: compare the conflict-resolution data associated with the linked value of the attribute in the object and the further conflict-resolution data associated with the linked value of the attribute in the replica object to resolve the replication conflict" at page 77;

- "update the linked value of the attribute in the replica object if the value has an earlier creation timestamp than the value of the attribute in the object; if the creation timestamp associated with the linked value of the attribute in the replica object is equivalent to the creation timestamp associated with the linked value of the attribute in the object, update the linked value of the attribute in the replica object if the linked value has a lower version number than the linked value of the attribute in the object" at page 77;

- "and if the version number associated with the linked value of the attribute in the replica object is equivalent to the version number associated with the linked value of the attribute in the object, update the linked value of the attribute in the

replica object if the value has an earlier update timestamp than the value of the attribute in the object" at page 77, 3rd paragraph.

As per claim 18, Norris teaches a state-based replication system, comprising:

- "an object having a multi-valued attribute that includes values, at least one of the linked value having associated therewith indicators to indicate a change to the linked value of the attribute" at page 68, Fig. 4-1.

- "at least a further object replicating the object, the further object having a multi-valued attribute" at page 68, Fig. 4-1;

- "at least one linked values having associated therewith indicators to indicate a change to the referenced linked value of the attribute" at page 68, Fig. 4-1;

- "a computing device configured to replicate the object and to identify a change to a linked value of the attribute by a change to one or more of the indicators corresponding to the referenced linked value of the object or the further object" at page 68, Fig. 4-1 and page 77.

The difference between Norris' teaching and the invention of claim 18 is that Norris does not explicitly teach: "a multi-valued attribute that includes a value which is a reference link to multiple referenced linked values" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having "a multi-valued attribute that includes a value which is a reference link to multiple referenced linked values" in an directory server such as Windows 2000 Active Directory.

Thus, It would have been obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and reduces resource required to maintain the consistency between objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 20, Norris and AAPA teach a state-based replication system as recited in claim 18 discussed above. Norris also teaches: "wherein the indicators comprise a version indicator that corresponds to a version of a linked value" at page 68, Fig. 4-1.

As per claim 21, Norris and AAPA teach the state-based replication system as recited in claim 18 discussed above. Norris also teaches: "wherein the indicators comprise an update indicator that corresponds to when a linked value is changed" at page 68, Fig. 4-1.

As per claim 22, Norris and AAPA teach the state-based replication system as recited in claim 18 discussed above. Norris also teaches: "wherein the indicators comprise a creation indicator that corresponds to when a linked value is created" page 68, Fig. 4-1.

As per claim 23, Norris and AAPA teach the state-based replication system as recited in claim 18 discussed above. Norris further teaches: "wherein the indicators comprise a version number that corresponds to a version of a linked value and an update timestamp that corresponds to when the linked value is changed" at page 68, Fig. 4-1.

As per claim 24, Norris and AAPA teach the state-based replication system as recited in claim 18 discussed above. Norris also teaches: "wherein the indicators comprise a creation timestamp that corresponds to when a linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at page 68, Fig. 4-1.

As per claim 27, Norris teach the state-based replication system, comprising:

- "a first computer configured to maintain a first data structure, the first data structure having a multi-valued attribute" at page 68, Fig. 4-1, ("Server A").
- "each linked value having conflict-resolution information to indicate a change to a corresponding linked value of the attribute" at page 68, Fig. 4-1;
- "a second computer configured to maintain a second data structure having the multi-valued attribute" at page 68, Fig. 4-1, ("Server B");
- "and the first and second data structures configured to be replicated and to have a replication conflict between a linked value of the attribute in the first data structure and a linked value of the attribute in the second data structure resolved

with the conflict-resolution information associated with the linked values" at pages 68 and 77.

The difference between Norris' teaching and the invention of claim 27 is that Norris does not explicitly teach: "a multi-valued attribute that includes a reference link to multiple referenced linked values" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having "a multi-valued attribute that includes a reference link to multiple referenced linked values" in an directory server such as Windows 2000 Active Directory. Thus, It would have been obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and reduces resource required to maintain the consistency between objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 28, Norris and AAPA teach the state-based replication system as recited in claim 27 discussed above. Norris also teaches:

- "the first and second computers are further configured to: compare the conflict-resolution information associated with the linked value of the attribute in the first data structure with the conflict-resolution information associated with the linked

value of the attribute in the second data structure; identify a replication conflict; and resolve the replication conflict with the conflict-resolution information associated with the linked values" at page 77.

As per claim 29, Norris and AAPA teach the state-based replication system as recited in claim 27 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value" at page 68, Fig. 4-1.

As per claim 30, Norris and AAPA teaches the state-based replication system as recited in claim 27 discussed above. Norris also teaches:

- "the conflict-resolution information comprises a version number that corresponds to a version of an individual linked value" at page 68, Fig. 4-1;
- "the first and second computers are further configured to compare the version number associated with the linked value of the attribute in the first data structure with the version number associated with the linked value of the attribute in the second data structure" at page 77;
- "the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has a lower version number than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the

second data structure if the linked value has a lower version number than the linked value of the attribute in the first data structure" at page 77, 3rd paragraph.

As per claim 31, Norris and AAPA teach the state-based replication system as recited in claim 27 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises an update indicator that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1;

As per claim 32, Norris and AAPA teach the state-based replication system as recited in claim 27 discussed above. Norris also teaches:

- "the conflict-resolution information comprises an update timestamp that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1;
- "the first and second computers are further configured to compare the update timestamp associated with the linked value of the attribute in the first data structure with the update timestamp associated with the linked value of the attribute in the second data structure; the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has an earlier update timestamp than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has an earlier update timestamp than the linked value of the attribute in the first data structure" at page 77, 3rd paragraph.

As per claim 33, Norris and AAPA teach the state-based replication system as recited in claim 27 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises a creation indicator that corresponds to when an individual linked value is created" at page 68, last paragraph.

As per claim 34, Norris and AAPA teach a state-based replication system as recited in claim 27 discussed above. Norris also teaches:

- "the conflict-resolution information comprises a creation timestamp that corresponds to when an individual linked value is created" at page 68, Fig. 4-1;
- "the first and second computers are further configured to compare the creation timestamp associated with the linked value of the attribute in the first data structure with the creation timestamp associated with the linked value of the attribute in the second data structure" at page 77, 3rd paragraph;
- "the first computer is further configured to update the linked value of the attribute in the first data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the second data structure; and the second computer is further configured to update the linked value of the attribute in the second data structure if the linked value has an earlier creation timestamp than the linked value of the attribute in the first data structure" at page 77.

As per claim 35, Norris and AAPA teach the state-based replication system as recited in claim 27 discussed above. Norris also teaches:

- "the conflict-resolution information comprises a version indicator that corresponds to a version of an individual linked value" at page 68, Fig. 4-1;

- "and an update indicator that corresponds to when the individual linked value is changed" at page 68, last paragraph.

As per claim 36, Norris and AAPA teach the state-based replication system as recited in claim 27discussed above. Norris also teaches:

- "the conflict-resolution information comprises a creation indicator that corresponds to when an individual linked value is created" at page 68, last paragraph;

- "a version indicator that corresponds to a version of the individual linked value" at page 68, Fig. 4-1;

- "and an update indicator that corresponds to when the individual linked value is changed" at page 68, Fig. 4-1.

As per claim 39, Norris teaches a computer-readable medium having stored thereon a first data structure and a second data structure, comprising:

- "a first data field of the first data structure containing an attribute" at page 68, Fig. 4-1;

- "a second data field of the first data structure containing a value of the attribute contained in the first data field, the linked values having respective conflict resolution" at page 68, Fig. 4-1;

- "a first data field of the second data structure containing a version indicator corresponding to a version of a linked value contained in the second data structure" at page 68, Fig. 4-1;

- "and a second data field of the second data structure containing an update indicator corresponding to when the version indicator contained in the first data field of the second data structure is changed" at page 68, Fig. 4-1.

The difference between Norris' teaching and the invention of claim 39 is that Norris does not explicitly teach: "the value being a reference link to multiple referenced linked values" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having attributes and values, wherein "the value being a reference link to multiple referenced linked values" in an directory server such as Windows 2000 Active Directory. Thus, It would have been obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and

reduces resource required to maintain the consistency between objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 40, Norris and AAPA teach the computer-readable medium as recited in claim 39 discussed above. Norris also teaches: "wherein the second data structure further comprises a third data field containing a creation indicator corresponding to when the linked value contained in the second data structure is created" at page 68, Fig. 4-1.

As per claim 42, Norris teaches a network system, comprising:

- "a first computer configured to replicate objects at an attribute level, and further configured to maintain an object having a multi-valued attribute" at page 68, Fig. 4-1;
- "a second computer configured to replicate the objects at an attribute value level, and further configured to maintain a second object, having the multi-valued attribute, each linked value configured to have respective conflict-resolution data" at page 68, Fig. 4-1;
- "the first computer further configured to: replicate the second object from the second computer" at page 68, Fig. 4-1; and
- "resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data associated with a linked value" at page 77.

The difference between Norris' teaching and the invention of claim 42 is that Norris does not explicitly teach: "multi-valued attribute that includes a value which is a reference link to multiple referenced linked value" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having "multi-valued attribute that includes a value which is a reference link to multiple referenced linked value" in an directory server such as Windows 2000 Active Directory. Thus, It would have been obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and reduces resource required to maintain the consistency between objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 43, Norris and AAPA teach a network system as recited in claim 42 discussed above. Norris also teaches: "wherein the first computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level" at page 77.

As per claim 44, Norris and AAPA teach a network system as recited in claim 42 discussed above. Norris also teaches: "wherein the first computer does not replicate a

linked value from the second object if the linked value does not have conflict-resolution data" at page 69, step 2.

As per claim 45, Norris and AAPA teach the network system as recited in claim 42 discussed above. Norris also teaches: "wherein the first computer does not replicate a linked value from the second object if the linked value has null conflict-resolution data" at page 69, step 2.

As per claim 46, Norris and AAPA teach the network system as recited in claim 42 discussed above. Norris also teaches: "wherein the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has conflict-resolution data" at page 77.

As per claim 47, Norris and AAPA teach the network system as recited in claim 42 discussed above. Norris also teaches: "wherein the first computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has non-null conflict-resolution data" at page 77.

As per claim 48, Norris and AAPA teach the network system as recited in claim 42 discussed above. Norris also teaches:

- "the second computer is further configured to: replicate the object from the first computer" at page 68, Fig. 4-1; and

- "resolve a replication conflict between the object and the second object at the attribute value level with the conflict-resolution data associated with a linked value" at page 77.

As per claim 49, Norris and AAPA teach a network system as recited in claim 48 discussed above. Norris also teaches: "wherein the second computer first resolves the replication conflict between the object and the second object at the attribute level, and second resolves the replication conflict between the object and the second object at the attribute value level" at page 77.

As per claim 50, Norris and AAPA teach the network system as recited in claim 48 discussed above. Norris also teaches: "the second computer does not replicate a linked value from the object if the linked value does not have conflict-resolution data" at page 69, step 2.

As per claim 51, Norris and AAPA teach the network system as recited in claim 48 discussed above. Norris also teaches: "wherein the second computer does not replicate a linked value from the object if the linked value has null conflict-resolution data" at page 69, step 2.

As per claim 52, Norris and AAPA teach the network system as recited in claim 48 discussed above. Norris also teaches: "wherein the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has conflict-resolution data" at page 77.

As per claim 53, Norris and AAPA teach the network system as recited in claim 48 discussed above. Norris also teaches: "wherein the second computer resolves the replication conflict between the object and the second object at the attribute value level in favor of a linked value that has non-null conflict-resolution data" at page 77.

As per claim 54, Norris and AAPA teach the network system as recited in claim 48 discussed above. Norris also teaches: "wherein the second computer is further configured to delete a linked value from the second object if the linked value does not have conflict resolution data, and if the linked value is not replicated from the object" at page 77, 1st paragraph.

As per claims 55, 72, Norris teaches a method and a computer readable medium for performing the method comprising:

- "replicating an object stored in a first directory with a replica object stored in a second directory, the object and the replica object having a multi-value attribute, the multiple linked values having respective conflict-resolution data associated therewith" at page 68, Fig. 4-1;
- "comparing an individual linked value of the attribute in the object with an individual linked value of the attribute in the replica object to identify a replication conflict" at page 77;

- "and resolving the replication conflict with the conflict-resolution data associated with the individual linked values" at page 77, 3rd paragraph.

The difference between Norris' teaching and the invention of claims 55, 72 is that Norris does not explicitly teach: "multi-valued attribute that includes a value which is a reference link to multiple linked value" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having "multi-valued attribute that includes a value which is a reference link to multiple linked value" in an directory server such as Windows 2000 Active Directory. Thus, It would have been obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and reduces resource required to maintain the consistency between objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 56, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value" at page 68, Fig. 4-1, and wherein "said comparing comprises determining if an individual linked value version number has been changed" at page 77, 3rd paragraph.

As per claim 57, Norris and AAPA teaches a method as recited in claim 55 discussed above. Norris also teaches wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value, said comparing comprises determining if an individual linked value version number has been changed" at page 68, Fig. 4-1 and page 77, 3rd paragraph;

- "the method further comprises updating the individual linked value of the attribute that has a lower version number with the individual linked value of the attribute that has a higher version number" at page 77, 3rd paragraph.

As per claim 58, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1, and wherein "said comparing comprises determining if an individual linked value update timestamp has been changed" at page 77.

As per claim 59, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises an update timestamp that corresponds to when an individual linked value is changed" at page 68, Fig. 4-1, "said comparing comprises determining if an individual linked value update timestamp has been changed, and the method further comprises updating the individual linked value of the attribute that has an earlier update timestamp with the

individual linked value of the attribute that has a later update timestamp" at page 77, 3rd paragraph.

As per claim 60, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches: "wherein "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, and wherein said comparing comprises determining if a creation timestamp has been changed" at page 68, Fig. 4-1 and page 77, 3rd paragraph.

As per claim 61, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, said comparing comprises determining if a creation timestamp has been changed, and the method further comprises updating the individual linked value of the attribute that has an earlier creation timestamp with the individual linked value of the attribute that has a later creation timestamp" at page 68, Fig. 4-1 and page 77.

As per claim 62, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is changed, and wherein said comparing comprises determining if an individual linked value version number has been changed and if the individual linked value update timestamp has been changed" at page 68, Fig. 4-1 and page 77.

As per claims 63, 64, Norris and AAPA teach the method and computer readable medium as recited in claim 55 discussed above. Norris also teaches wherein:

- "the conflict-resolution data comprises a version number that corresponds to a version of an individual linked value and an update timestamp that corresponds to when the individual linked value is changed" at page 68, Fig. 4-1;
- "and the method further comprises updating the individual linked value of the attribute that first has a lower version number, and second has an earlier update timestamp" at page 77, 3rd paragraph.

As per claim 65, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches wherein:

- "the conflict-resolution data comprises a creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is changed" at page 68;
- "and wherein said comparing comprises determining if an individual linked value creation timestamp has been changed, if the individual linked value version number has been changed, and if the individual linked value update timestamp has been changed" at page 77.

As per claims 66-67, Norris and AAPA teach the method as recited in claim 55 discussed above. Norris also teaches: "wherein the conflict-resolution data comprises a

creation timestamp that corresponds to when an individual linked value is created, a version number that corresponds to a version of the individual linked value, and an update timestamp that corresponds to when the individual linked value is changed" at page 68; and the method further comprises "updating the individual linked value of the attribute that first has an earlier creation timestamp, second has a lower version number, and third has an earlier update timestamp" at page 77, 3rd paragraph.

As per claims 73, 80, Norris teaches a method and a computer readable medium performing the method of replicating at least one linked value of a multi-valued attribute contained in an object comprising:

"comparing the conflict-resolution information associated with the linked value as referenced by the value in the object with the conflict-resolution information associated with the linked value as referenced by the value in the replica object; identifying a replication conflict with the conflict-resolution information associated with the linked values; and resolving the replication conflict with the conflict-resolution information" at page 77.

The difference between Norris' teaching and the invention of claims 73, 80 is that Norris does not explicitly teach: "multi-valued attribute that includes a value which is a reference link to multiple linked value" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having "multi-valued attribute that includes a value which is a reference link to multiple linked value" in an directory server such as Windows 2000 Active Directory. Thus, It would have been

obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and reduces resource required to maintain the consistency between objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 74, Norris and AAPA teach the method as recited in claim 73 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises a version number that corresponds to a version of the linked value, and the method further comprising: determining if the linked value version number has been changed; and updating the linked value of the attribute that has a lower version number with the linked value of the attribute that has a higher version number" at page 77, 3rd paragraph.

As per claim 75, Norris and AAPA teach the method as recited in claim 73 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises an update timestamp that corresponds to when the linked value is changed, and the method further comprising: determining if the linked value update timestamp

has been changed; and updating the linked value of the attribute that has an earlier update timestamp with the linked value of the attribute that has a later update timestamp" at page 77, 3rd paragraph.

As per claim 76, Norris and AAPA teach the method as recited in claim 73 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created" at page 68, and "the method further comprising: determining if the linked value creation timestamp has been changed; and updating the linked value of the attribute that has an earlier creation timestamp with the linked value of the attribute that has a later creation timestamp" at page 77.

As per claim 77, Norris and AAPA teach the method as recited in claim 73 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at page 68, Fig. 4-1.

As per claims 78-79, Norris and AAPA teach the method and a computer readable medium performing the method as recited in claim 73 discussed above. Norris also teaches: "wherein the conflict-resolution information comprises a creation timestamp that corresponds to when the linked value is created, a version number that corresponds to a version of the linked value, and an update timestamp that corresponds to when the linked value is changed" at page 68, and the method further comprises

"updating the linked value of the attribute if the linked value first has an earlier creation timestamp, second has a lower version number, and third has an earlier update timestamp" at page 77, 3rd paragraph.

As per claims 81, 86, Norris teaches a method and a computer readable medium performing the method, comprising:

- "replicating a first object with a second object, the first object having an attribute that includes a value" at page 68, Fig. 4-1;
- "the second object having an attribute that includes a value, each linked value configured to have associated conflict-resolution data" at page 68, Fig. 4-1;
- "resolving first a replication conflict between the first object and the second object at an attribute level; and resolving second, a replication conflict between the first object and the second object at an attribute value level with the conflict-resolution data associated with the multiple linked values" at page 77.

The difference between Norris' teaching and the invention of claims 81, 86 is that Norris does not explicitly teach: "attribute that includes a value which is a reference link to multiple referenced linked values" as claimed. However, it is well known in the art, as admitted by AAPA at pages 1-7 and Figs. 1-2, to define an object having "attribute that includes a value which is a reference link to multiple referenced linked values" in an directory server such as Windows 2000 Active Directory. Thus, It would have been

obvious to one of ordinary skill in the art to associate conflict-resolution data as taught by Norris with each linked value of the multi-valued attribute's value of the prior art system described by AAPA so that the change to each individual linked value could be detected quickly and the conflict-resolution associated with each linked value could be use resolve conflict at a finer granularity level. The combined system therefore improves performance and reduces resource required to maintain the consistency between objects and the replica objects, by updating only changed values instead of the whole object or attributes.

As per claim 82, Norris and AAPA teach the method as recited in claim 81 discussed above. Norris further teaches: "determining whether a value corresponding to the second object has conflict-resolution data and said replicating the linked value if said determining that the linked value has conflict-resolution data" at page 69, step 2.

As per claim 83, Norris and AAPA teach the method as recited in claim 81 discussed above. Norris also teaches: "determining whether a linked value corresponding to the second object has non-null conflict-resolution data and said replicating the linked value if said determining that the value has non-null conflict-resolution data" at Col. 8 lines 13-67 and Col. 33 lines 30 to Col. 34 line 20.

As per claim 84, Norris and AAPA teach the method as recited in claim 81 discussed above. Norris also teaches: "said resolving the replication conflict between

the first object and the second object at the attribute value level in favor of a linked value that has conflict-resolution data" at page 77.

As per claim 85, Norris and AAPA teach the method as recited in claim 81 discussed above. Norris also teaches: "deleting a linked value corresponding to the second object if the value does not have conflict-resolution data and if the value is not replicated" at page 77, 1st paragraph.

7. **Claims 15-17, 25-26, 37-38, 41, 68-71 are rejected** under 35 U.S.C. 103(a) as being unpatentable over Norris and AAPA as applied to claims **1-14, 18, 20-24, 27-36, 39-40, 42-67, 72-86** above, and further in view of Bodnar et al. (US 6,295,541 B1)

As per claim 15, Norris and AAPA teach the network system as recited in claim 1 above. Norris and AAPA do not teach: "the individual values have an associated deletion indicator that is a null identifier to indicate the existence of a value of the attribute in the object". However, Bodnar teaches a similar method for synchronizing replica objects including "the individual values have an associated deletion indicator that is a null identifier to indicate the existence of a value of the attribute in the object" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, so that the replica object could be updated accordingly to

reflect the changes and maintain the consistency between the object and the replica object.

As per claim 16, Norris and AAPA teach the network system as recited in claim 1 discussed above. Norris and AAPA do not teach: "the individual values have an associated deletion indicator that corresponds to when an individual value is marked for deletion from the attribute in the object". However, Bodnar teaches a similar method for synchronizing replica objects including "the individual values have an associated deletion indicator that corresponds to when an individual values is marked for deletion from the attribute in the object" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion indicator with an individual value as taught by Bodnar to indicate whether an individual value has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 17, Norris and AAPA teach a network system as recited in claim 1. Norris and AAPA does not teach: "the individual values have an associated deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute in the object; and wherein the second computer is further configured to delete a value from the attribute in the object if the value has a deletion timestamp that indicates the value is marked for deletion". However, Bodnar teaches a similar method for synchronizing replica objects including: "the individual values have an associated

deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute in the object; and wherein the second computer is further configured to delete a value from the attribute in the object if the value has a deletion timestamp that indicates the value is marked for deletion" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 63-67, and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion timestamp with an individual value as taught by Bodnar to indicate the time an individual value has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 25, Norris and AAPA teach the state-based replication system as recited in claim 18 discussed above. Norris and AAPA do not explicitly teach: "the indicators comprise a deletion indicator that has a null identifier to indicate the existence of a linked value of the attribute". However, Bodnar teaches a similar method including "the indicators comprise a deletion indicator that has a null identifier to indicate the existence of a linked value of the attribute" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, in order to make it easier to replicate the change to its replica object.

As per claim 26, Norris and AAPA teach the state-based replication system as recited in claim 18 discussed above. Norris and AAPA do not teach: "the indicators

comprise a deletion timestamp that corresponds to when a linked value is marked for deletion from the attribute" However, Bodnar teaches a similar method including: "the indicators comprise a deletion timestamp that corresponds to when a linked value is marked for deletion from the attribute" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 63-67, and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion timestamp with an individual value as taught by Bodnar to indicate the time an individual value has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 37, Norris and AAPA teach the state-based replication system as recited in claim 27. Norris and AAPA do not teach: "the individual linked values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value of the multi-valued attribute". However, Bodnar teaches a similar method including "the individual values have an associated deletion indicator that is a null identifier to indicate the existence of a linked value" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 38, Norris and AAPA teach the state-based replication system as recited in claim 27 discussed above. Norris and AAPA do not teach: "the individual linked values have an associated deletion indicator that corresponds to when an individual linked value is marked for deletion from the multi-valued attribute". However, Bodnar teaches a similar method including "the individual linked values have an associated deletion indicator that corresponds to when an individual linked value is marked for deletion from the multi-valued attribute" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 41, Norris and AAPA teach the computer-readable medium as recited in claim 39 discussed above. Norris and AAPA do not teach: "the second data structure further comprises a third data field containing a deletion indicator corresponding to the linked value contained in the second data structure and configured to indicate when the linked value is marked for deletion from the second data structure". However, Bodnar teaches a similar method including "the data structure further comprises a sixth data field containing a deletion indicator corresponding to the value contained in the second data field and configured to indicate when the value is marked for deletion from the data structure" at Col. 39 line 45 to Col. 40 line 10 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the

invention to modify Norris and AAPA to associate a deletion indicator with each record as taught by Bodnar to indicate whether a record has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 68, Norris and AAPA teach the method as recited in claim 55. Norris and AAPA do not teach: "the individual values have a deletion timestamp that is a null identifier to indicate the existence of a value of the attribute". However, Bodnar teaches a similar method including "the individual values have a deletion timestamp that is a null identifier to indicate the existence of a value of the attribute" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion timestamp with each record as taught by Bodnar to indicate whether a record has been deleted and the time it has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claim 69, Norris and AAPA teach the method as recited in claim 55. Norris and AAPA do not teach: "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute". However, Bodnar teaches a similar method including "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B.

Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris and AAPA to associate a deletion timestamp with each record as taught by Bodnar to indicate whether a record has been deleted and the time it has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

As per claims 70-71, Norris and AAPA teach the method as recited in claim 55. Norris and AAPA does not teaches: "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute, and the method further comprises deleting a value from the attribute if the value has a deletion timestamp that indicates the value is marked for deletion" However, Bodnar teaches a similar method including "the individual values have a deletion timestamp that corresponds to when an individual value is marked for deletion from the attribute, and the method further comprises deleting a value from the attribute if the value has a deletion timestamp that indicates the value is marked for deletion" at Col. 39 line 45 to Col. 40 line 10, Col. 50 lines 40-67 and Fig. 10B. Thus, it would have been obvious to those of ordinary skill in the art at the time of the invention to modify Norris to associate a deletion timestamp with each record as taught by Bodnar to indicate whether a record has been deleted and the time it has been deleted, so that the replica object could be updated accordingly to reflect the changes and maintain the consistency between the object and the replica object.

Response to Arguments

8. Applicant's arguments filed August 18, 2005 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

9. The prior art made of record, listed on form PTO-892, and not relied upon, if any, is considered pertinent to applicant's disclosure.

If a reference indicated as being mailed on PTO-FORM 892 has not been enclosed in this action, please contact Lisa Craney whose telephone number is **(571) 272-3574** for faster service.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khanh B. Pham whose telephone number is (571) 272-4116. The examiner can normally be reached on Monday through Friday 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hosain Alam can be reached on (571) 272-3978. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Khanh B. Pham
Examiner
Art Unit 2166

November 26, 2005